

CLAIMS

What is claimed as invention is:

1. A multilayered pressure vessel, comprising:

at least one single ply sheet of flexible material (100) having an approximate
5 longitudinal midline (M) dividing said sheet of flexible material into an inner portion (130)
having an inner surface (190), an outer surface (180), an edge (195), a seam allowance (200),
and a width (140), and an outer portion (110) having an inner surface (160), an outer surface
(160), an edge (165), a seam allowance (170), and a width (120), wherein said width of said
outer portion is greater than said width of said inner portion; and

10 a primary seam (250) binding said outer portion and said inner portion to said sheet of
flexible material at the approximate midline and proximate said outer portion edge and said
inner portion edge;

wherein said sheet of flexible material is wrapped into a substantially continuous,
approximately 720 degree wrap to form a vessel body in which said outer surface of said
15 outer portion forms the exterior surface (150a) of said multilayered pressure vessel, said
inner surface of said inner portion comprises the innermost interior surface (190a) of said
vessel body, said outer surface of said inner portion and said inner surface of said outer
portion are in face-to-face relation, and said seam is concealed by said seam allowance of
said outer portion.

20 2. The multilayered pressure vessel of claim 1, wherein said outer portion and said
inner portion are each substantially rectangular and said vessel body (10) is substantially
cylindrical.

25 3. The multilayered pressure vessel of claim 1, wherein said outer portion and said
inner portion are each a trapezium and said vessel body (1900) comprises a truncated cone
shape.

4. The multilayered pressure vessel of claim 1, wherein said apparatus has a proximate end (340) and a distal end (350), and wherein each end has an end fitting (600), at least one of which includes gas inlet and outlet means (690).

5. The multilayered pressure vessel of claim 4, wherein at least one said fittings includes:

a cap neck (630), said cap neck having a coupling means (640) and a terminal side (740);

an outer pressure lock ring (660) coupled to said cap neck through coupling means (670) complementary to said cap neck coupling means;

a retaining ring (620) snap fit over said cap neck and around which is wrapped the pressure vessel body, said retaining ring interposed between said cap neck and said outer pressure lock ring; and

a retaining washer (650) is placed over said retaining ring and interposed between said pressure lock ring, said retaining ring, and said cap neck.

6. The multilayered pressure vessel of claim 5, further including a plurality of tuning cables (860) connected to and extending between said end fittings.

7. The multilayered pressure vessel of claim 6, further including a plurality of cable tuning sleeves (840) disposed on said exterior surface of said apparatus, each cable tuning sleeve covering at least one tuning cable.

8. The multilayered pressure vessel of claim 6, further including a plurality of cable tuning sleeves (1020) disposed between said outer portion inner surface and said inner portion outer surface, each of said sleeves containing at least one tuning cable.

9. The multilayered pressure vessel of claim 4, further including a hose for placing

said apparatus into fluid communication with another multilayered pressure vessel.

10. The multilayered pressure vessel of claim 1, further including at least connection means for connecting said apparatus to other multilayered pressure vessels.

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11. A method of making a pressure vessel, comprising the steps of:

(a) providing a generally elongate flexible material sheet (100) having a proximal end (340), a distal end (350), and first and second edges (165), (195);

10 (b) folding the sheet by bringing the first edge downward and under the sheet to form an outer portion (110) having an outer portion flap (280), an outer passageway (230), and a first seam allowance (170);

15 (c) folding the sheet again by bringing the second edge upward and over the sheet to form an inner portion (130) having an inner portion flap (270), an inner passageway (240), and a second seam allowance (200), and such that the first and second seam allowances overlap and such that a section (260) of sheet is interposed between the inner and outer portion flaps and the first and second seam allowances to form a multilayered configuration (20);

(d) sewing a seam to make a single primary seam (250), which binds the layers of the multilayer configuration together;

20 (e) providing pulling means (310) and affixing the pulling means to the inner portion upper flap (270) at the proximate end (340) of the sheet; and

(f) pulling the inner portion into outer passageway (230) at the proximate end (340) while simultaneously turning outer portion (110) inside out by pulling its distal end (350) over the increasingly overlapping outer and inner passageways, thereby turning the apparatus inside out and pulling primary seam (250) interiorly such that it is interposed
25 between the outer portion (110) and the inner portion (130).

12. The method of claim 11, wherein at step (e) the pulling means is a line.

13. The method of claim 11, wherein step (a) comprises providing a flexible material sheet having an approximate longitudinal midline dividing the sheet into substantially rectangular inner and outer portions.

5 14. The method of claim 11, wherein step (a) comprises providing a flexible material sheet having an approximate longitudinal midline dividing the sheet into an inner portion comprising a trapezium and an outer portion comprising a trapezium.

10 15. A multilayered pressure vessel produced according to the process of claim 11.

16. A multilayered pressure vessel produced according to the process of claim 13.

18. A multilayered pressure vessel produced according to the process of claim 14.